



3Com® Router 6000 Family

Getting Started Guide

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Download the latest software and documentation for your 3Com® Router

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About This Guide

This guide provides the information you need to install and use the 3Com® Router 6000 Family.

The guide is intended for use by network administrators who are responsible for installing and configuring network equipment; consequently, it assumes a basic working knowledge of LANs (Local Area Networks).

Before You Start

This section contains information about the documents and CD-ROM that accompany your Router 6000.

Release Notes

The release notes provide important information about the current software release including new features, modifications, and known problems. You should read the release notes before installing the router in your network.



If the information in the release notes differ from the information in this guide, follow the instructions in the release notes.




Most user guides and release notes are available in Adobe Acrobat Portable Document Format (PDF) or HTML on the 3Com Web site:

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Conventions

Table 1 lists conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device
	Warning	Information that alerts you to potential personal injury

Related Documentation

In addition to this guide, the Router 6000 documentation set includes the following:

- *Router 5000/6000 Configuration Guide*
This guide contains information on the features supported by your Switch and how they can be used to optimize your network. It is supplied in PDF format on the CD-ROM that accompanies the Switch.
- *Router 5000/6000 Command Reference Guide*
This guide provides detailed information about the web interface and command line interface that enable you to manage the Switch. It is supplied in PDF format on the CD-ROM that accompanies the Switch.
- *Router 5000/6000 Module Manual*
This manual describes the various modules that are available for use with the Router 5000 and Router 6000.
- Release Notes
These notes provide information about the current software release, including new features, modifications, and known problems. The release notes are supplied on the 3Com Web site.

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1 Introducing the Router 6000 Family

This section introduces the 3Com® Router 6000 and describes how it can be used in your network. It covers summaries of hardware and software features and also the following topics:

- About the Router 6000
- 3Com Router 6040
- 3Com Router 6080
- System Description
- The RPU Module
- The RPU2 Module
- The PSU Module

About the Router 6000

The 3Com Router 6000 Family are high-performance edge routers that support flexible interface cards (FICs), hot swappable fan modules, and power supply units (PSUs) in 1+1 redundancy.

Abundant FIC options Abundant flexible interface cards (FICs) are available for the Router 6000 allowing great flexibility and investment protection.

Ethernet access The electrical and fiber (multi-mode and single-mode) FE FICs available with the Router 6000 support PPPoE and PPPoEoA that can offer authentication, authorization, and accounting (AAA) services for Ethernet access, hence satisfying the requirements of government offices and enterprises in broadband access.

ATM and DSL Installed with an ADSL or G.HSDSL card, the Router 6000 can connect the medium-to-small-sized enterprises to the digital subscriber line access multiplexer (DSLAM) equipment through a public switched telephone network (PSTN) and then to the Internet. The Router

6000 can be installed with an ATM cards to connect its network to an ATM network.

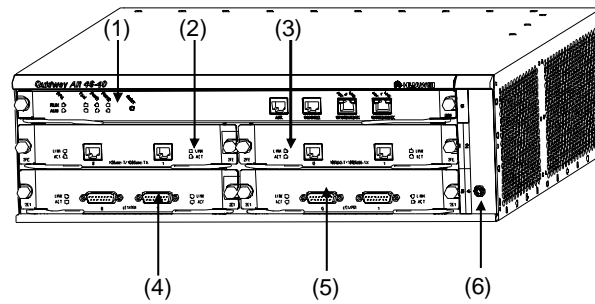
MPLS Multiprotocol label switching (MPLS), a combination of IP and ATM technologies, can provides faster forwarding speed and get support from IP protocols to accommodate to emerging applications.

Data security and reliability The following are the data security and reliability features that the Route 6000 supports:

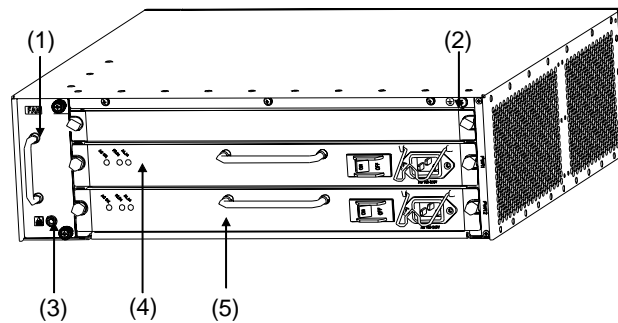
- NAT. Besides some basic functions, NAT can limit concurrent connections to a single user, and thus alleviate negative impacts caused by malicious resource occupation without affecting the normal network applications. In addition, NAT of the Router 6000 also provides the application layer gateway (ALG) function specific to FTP and ICMP.
- Authentication protocols such as PAP, CHAP, data RADIUS, and VoIP RADIUS.
- Packet filter and firewall, which fend off external attacks.
- VPN (including GRE, L2TP, and MPLS) and the technologies of IPSec and IKE. They can ensure security of private networks in an Internet environment.
- Backup center and virtual router redundancy protocol (VRRP). By providing a backup scheme in case of communication line or device failures, they enhance robustness and reliability of networks. Backup center also supports backup load sharing.
- Hot swappable fans, interface cards, and PSUs to ensure high reliability.

Online software upgrading The onboard Flash memory allows you to upgrade the software online, add new features, and extend new functions.

Abundant fault isolation methods The Router 6000 monitor the states of system configurations, system service channels, and system resources is available, and provides fault indication via console and network management host. In addition, logging is provided for recording and outputting any abnormal information.

3Com Router 6040**Figure 1** Front panel of the 3Com Router 6040

- | | |
|-------------------------------------|------------------------------------|
| 1) Slot0 for the main control board | 2) FIC Slot1 |
| 3) FIC Slot2 | 4) FIC Slot3 |
| 5) FIC Slot4 | 6) ESD-preventive wrist strap port |

Figure 2 Rear panel of the 3Com Router 6040

- | | |
|------------------------------------|--------------------|
| 1) Fan module | 2) Grounding screw |
| 3) ESD-preventive wrist strap port | 4) PSU 1 (PWR1) |
| 5) PSU 2 (PWR2) | |

3Com Router 6080

Figure 3 Front panel of the 3Com Router 6080

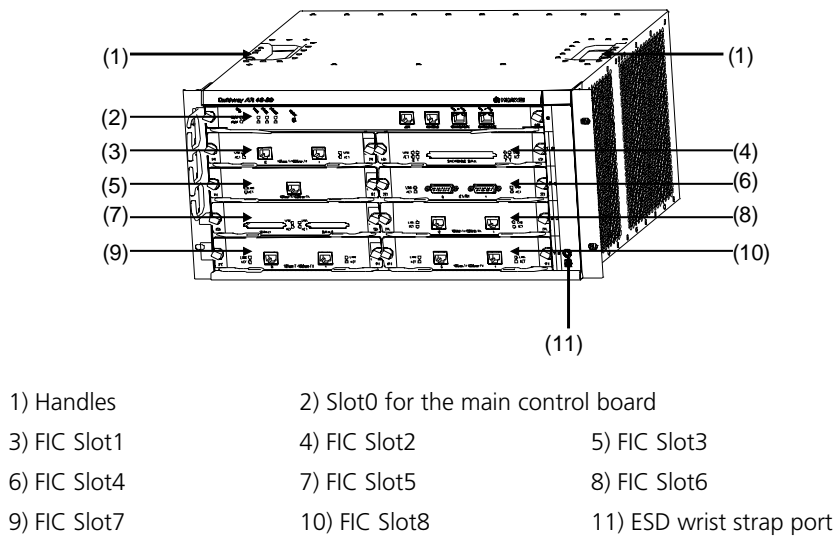
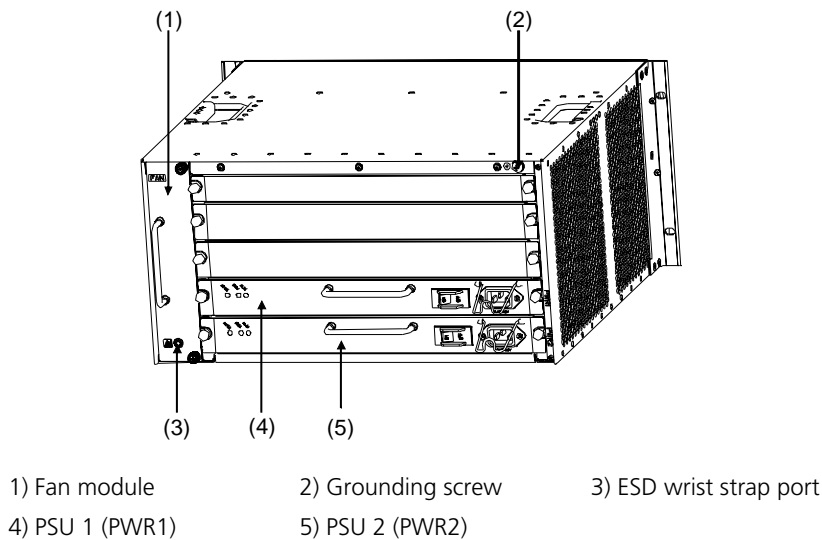


Figure 4 Rear panel of the 3Com Router 6080



System Description

Table 1 System description of the 3Com Router 6040/6080

Item	3Com Router 6040	3Com Router 6080
FIC slot	4	8
Dimensions (H x W x D)	130.5 x 436.2 x 420 mm (5.1 x 17.2 x 16.5 in.)	219.5 x 436.2 x 420 mm (8.6 x 17.2 x 16.5 in.)
Weight	18.7 kg (41.2 lb.)	28 kg (61.7 lb.)
Input voltage	Rated voltage: 100 to 240 VAC; 50/60 Hz Max. voltage: 85 to 264 VAC; 50/60 Hz Max. current: 4.0A/2.0A/2.0A (3Com Router 6080/6040)	
Max. power	126 W	213 W
Operating temperature	0 to 40°C (32°F to 104°F)	
Relative humidity (non-condensing)	5 to 90%	



The selection of SDRAM and Flash memory depends on the main control board. For their specifications, refer to “The RPU Module” and “The RPU2 Module”.

The standard shipment provides a single PSU for power supply, but you can order one more PSU for redundancy. See “The PSU Module”.

About the Router Processor Unit

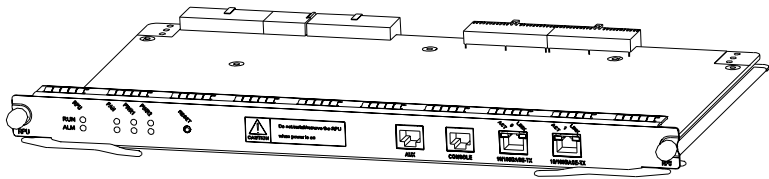
The **router processing unit** (RPU or RPU2) is the main controller for the Router 6000. The RPU or RPU2 handles protocols, forwards low-speed packets, governs interfaces, and detects faults. You can see information about the operating state of the FAN module, PSU, and system using the LEDs on the RPU or RPU2. Alternatively, you can monitor system status using a network management system. The RPU or RPU2 also provides a hardware reset button.



*Your Router 6000 may have one of two different Router Process Units: and **RPU** or and **RPU2**. For information on the RPU, refer to “The RPU Module”. For information on the RPU2, refer to “The RPU2 Module”.*

The RPU Module

Figure 5 The RPU



Your Router 6000 may have one of two different Router Process Units: and **RPU** or and **RPU2**. For information on the RPU2, refer to “The RPU2 Module”.

Specifications

Table 2 RPU specifications

Item	Specifications
Fixed interface	2 x 10/100 Mbps Ethernet interfaces
	1 AUX port
	1 console port
Processor	733 MHz
Boot ROM	1024 KB
NVRAM	512 KB
SDRAM	512 MB
Flash	32 MB



- SDRAM is the memory where the communication data between the system and CPU is stored.
- NVRAM is the place where the alarm records are stored.
- Flash is the main file storage medium to store application program files, anomaly information, and configuration files.
- Boot ROM stores the boot program files.

Indicators and Button

Figure 6 Front panel of the RPU

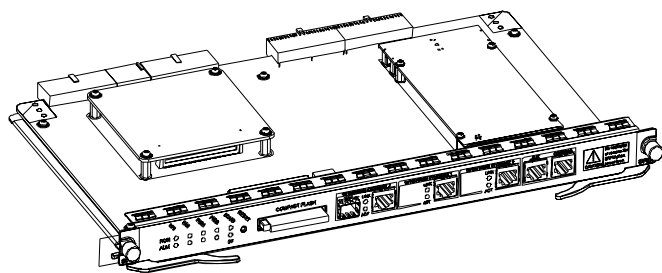


Table 3 RPU Indicator LEDs and button

LED and Button		Description
RUN (green)	RPU	System operating LED. Blinking means CPU is in normal operation; steady ON or OFF means CPU has failed.
	FAN	Steady ON means the FAN module is operating normally.
	PWR1	Steady ON means the PSU 1 is operating normally, and steady OFF means the PSU 1 is not present or has failed.
	PWR2	Steady ON means the PSU 2 is operating normally, and steady OFF means the PSU 2 is not present or has failed.
ALM (red)	RPU	ON means CPU has received an alarm signal, such as PSU or FAN alarm (due to over temperature, for example).
	FAN	ON means the FAN module is not present or its rotation is blocked.
	PWR1	ON means the PSU 1 has failed.
	PWR2	ON means the PSU 2 has failed.
RESET		The RPU hardware reset button.
10/100/1000 Mbps interface LED	LINK (green)	OFF means no link is present and ON means a link is present.
	ACT (yellow)	OFF means no data is being transmitted or received on the interface and blinking means data is being transmitted or/and received.

The RPU2 Module

Figure 7 The RPU2



Your Router 6000 may have one of two different Router Process Units: and **RPU** or and **RPU2**. For information on the RPU, refer to “The RPU Module”.

Specifications

Table 4 RPU2 specifications

Item	Specifications
Fixed interface	2 x 10/100/1000 Mbps electrical Ethernet interfaces 1 x 10/100/1000 Mbps Ethernet interface (providing both electrical and fiber-optic connectors) 1 AUX port 1 console port CF card slot (the CF card is optional)
Processor	700 MHz
Boot ROM	512 KB
NVRAM	512 KB
DDR SDRAM	512 MB
Flash	64 MB



- *SDRAM is the memory where the communication data between the system and CPU is stored.*
- *NVRAM is the place where the alarm records are stored.*
- *Flash is the main file storage medium to store application program files, anomaly information, and configuration files.*
- *Boot ROM stores the boot program files.*

Indicators and Button

Figure 8 Front panel of RPU2

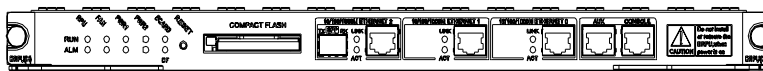


Table 5 RPU2 LEDs and the button

LED and button		Description
RUN (green)	RPU	System operating LED. Blinking means CPU is in normal operation; steady ON or OFF means CPU has failed.
	FAN	Steady ON means the FAN module is operating normally.
	PWR1	Steady ON means the PSU 1 is operating normally, and steady OFF means the PSU 1 is not present or has failed.
	PWR2	Steady ON means the PSU 2 is operating normally, and steady OFF means the PSU 2 is not present or has failed.
ALM (red)	RPU	ON means CPU has received an alarm signal, such as PSU or FAN alarm (due to over temperature, for example).
	FAN	ON means the FAN module is not present or its rotation is blocked.
	PWR1	ON means the PSU 1 has failed.
	PWR2	ON means the PSU 2 has failed.
ECARD (green)		OFF means no card is present. ON means a card is present and initialized. Blinking means data is being transmitted or/and received.
CF (green)		OFF means no CF card is present. ON means a CF card is present. Blinking means the CF card is reading/writing data. To prevent data corruption, do not remove the running CF card.
RESET		The RPU2 hardware reset button.
10/100/1000 Mbps interface LED	LINK (green)	OFF means no link is present and ON means a link is present.
	ACT (yellow)	OFF means no data is being transmitted or received on the interface and blinking means data is being transmitted or/and received.

Encryption Accelerator Daughter Card

The RPU2 supports the Encryption Accelerator daughter card. This optional add-on for the RPU2 uses hardware encryption to expedite IP packet encryption and provides support for IPSec and DVPN.

The PSU Module

The power supply system of the Router 6000 can work in either single-power or dual-power mode. In dual-power mode, the two power supply units (PSUs) function in redundancy or load sharing mode. That means, when a PSU fails or its power supply is disconnected, the other PSU can still work and supply all the power required by the system.

The PSUs supply 350W power and provide overcurrent and overvoltage protection. You can connect a PSU to the backplane by inserting it from the rear of the router chassis. It is hot swappable and its switchover does not affect the ongoing system operation.



When installing your router in a communications equipment room, ensure that the power distribution cabinet can provide a lightning protection box or arrester against the current of 20 KA and above.

Figure 9 Router 6000 PSU

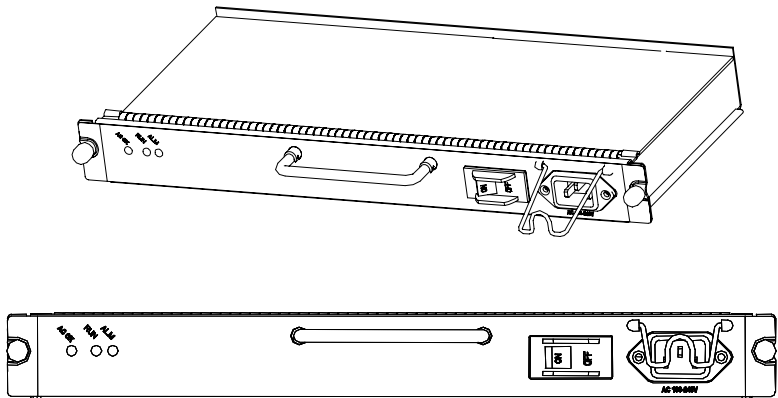


Table 6 LED description

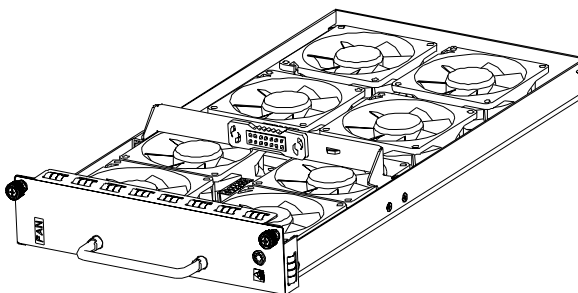
LED	Description
ALM (red)	ON means the PSU is not present or has failed.
RUN (green)	Steady ON means the PSU is operating normally, and OFF means the PSU has failed.
OK (red)	PSU input LED. Steady ON means the normal voltage (85 to 264 V) is inputting, and OFF means the opposite.

FAN module

The Router 6040 and Router 6080 are equipped with pairs of FAN cooling modules. The two fans in each pair work together to provide redundancy. The failure of one fan does not affect the operation of the other fans, and normal system operating temperature can be maintained.

The speed of the fans is controlled by the RPU or RPU2 to maintain optimum system temperature. If a fan stops working, the RPU or RPU2 will display an alarm.

The following figure shows a FAN module, using the 3Com Router 6080 as an example.

Figure 10 FAN module (Router 6080 shown)

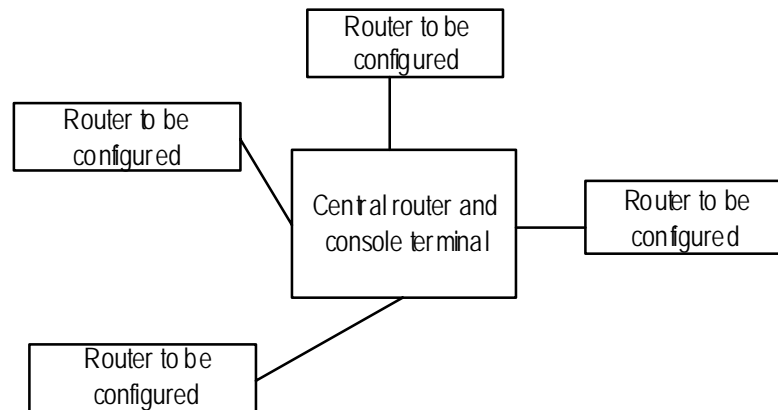
Auto-Config

With the automatic configuration (auto-config) feature, your Router 6000 can automatically detect and configure all its interfaces upon its first use and start Telnet, FTP, or Web service. Then the connected router or console terminal that has been pre-configured at the network center automatically connects to the router to configure it or to transfer the configuration file. Alternatively, this connection can be initiated administratively.

Auto-config is well suited to the low-end and mid-range routers on the edge of enterprise networks. To build up a network for configuring your router automatically and remotely, connect the router to the router at the network center depending on the specific interface that you use:

- For an E1, T1, E3, and T3 interface, use the fiber-optic line of PDH/SDH network.
- For a serial (in synchronous mode), asynchronous, E1-F, or E1-F interface, use the synchronous/asynchronous leased line of digital data network (DDN).
- For a 10/100 Mbps Ethernet interface, use the 10/100 Mbps Ethernet.
- For an analog modem (AM) interface, use the analog telephone line of PSTN network.

Figure 11 Network design for auto-config configuration



Auto Detect

Auto detect is a function for checking the connectivity of a network regularly by sending ICMP Request/Reply packets. It works by checking a group of destination IP addresses to see whether the hosts are reachable or unreachable. Based on the result, the router can discover problems and take appropriate actions.

The result of auto detect can be used by other features to control whether the configurations for the features can take effect.

2 Installation

3Com B68 cabinets are available for mounting the 3Com Router 6000 Family. For more information on the cabinets and their installation refer to the chapter “Installing the B68 Cabinet”.

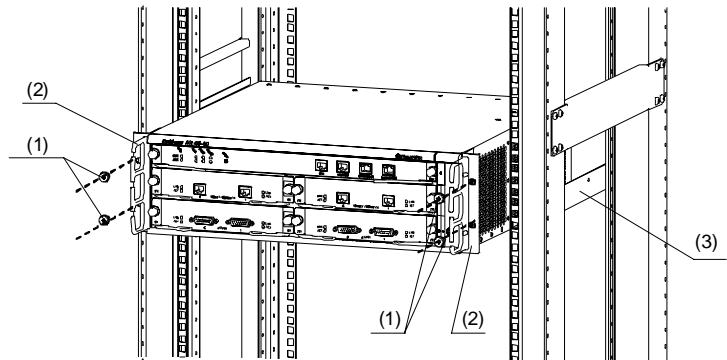
Rack-Mounting the Router

The 3Com Router 6000 is designed to fit 19-inch standard racks. The following table describes their dimensions:

Table 7 Dimensions of the 3Com 6000 Routers

Model	Dimensions
Router 6040 (H x W x D)	130.5 x 436.2 x 420 mm (5.1 x 17.2 x 16.5 in.)
Router 6080 (H x W x D)	219.5 x 436.2 x 420 mm (8.6 x 17.2 x 16.5 in.)

Figure 12 Mount the router in a rack



1) Mounting screws

2) Mounting brackets
(with cable-management
brackets installed)

3) Guides

Mounting the Router on a Tabletop

When mounting the router on a tabletop, ensure that the surface is clean and you have considered the following:

- The table is sturdy and well grounded.
- 10 cm (3.9 in.) clearance is available around the sides of the chassis for heat dissipation.
- Do not place any heavy object on the chassis.

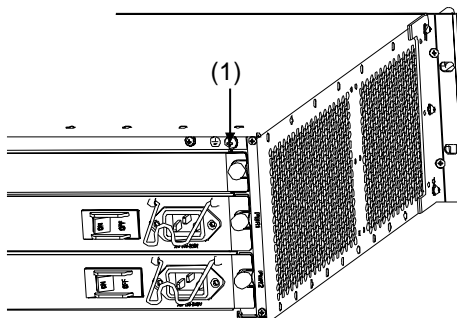
Power Cords, Grounds and Cables

PGND Wire



WARNING: *The normal connection of the protection ground (PGND) on the router chassis is an essential safeguard against lightning shocks and interference. You must correctly connect the PGND when installing or using the router.*

As shown in the following figure, the router provides a protection ground (PGND) screw at the top right-rear of the chassis. You must securely connect it to the earth ground to safely channel faradic current and leakage electricity to the ground and have the device less susceptible to electromagnetic interference (EMI). The PGND also protects the system against the high voltage of lightning shocks caused by external network lines like E1/T1 and ISDN/PSTN lines.

Figure 13 PGND screw on the chassis

1) Grounding screw

Connect the PGND to the earth ground using a PGND cable with a grounding resistance less than 5-ohm. If you install the chassis in a 19-inch standard rack, you must also ground the rack.

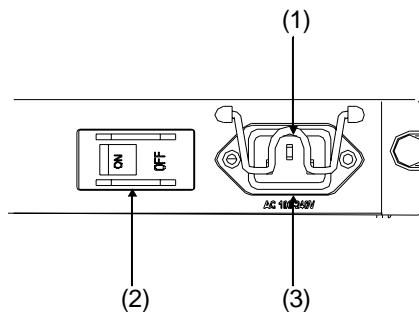


WARNING: Lightning strikes can damage your router and even the connected devices. For secure lightning protection, make sure that your router has a good ground connection when it is operating.

AC-Input Power Cord

AC input range: 100 to 240 VAC, 50 to 60 Hz.

The following figure shows the power socket on an AC-powered router.

Figure 14 AC-input power socket

1) Cable-retention clip

2) Power switch

3) AC input

AC power socket (recommended)

You are recommended to use a three-terminal single-phase power socket with ground contact, which must be grounded reliably. Normally, the ground contact of the power supply system in a building was buried during construction and cabling. Still, before connecting the AC-input power cord, you must make sure that the power supply of the building is well grounded.

Console Terminal Cable

Console port

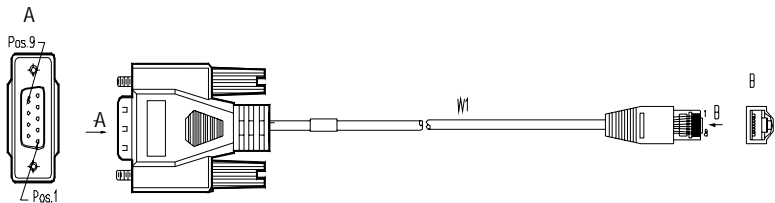
The Router 6000 provides an RS232 asynchronous serial console port (CON) for router configuration. For its attributes refer to “The RPU Module” or “The RPU2 Module”.

Console cable

A console cable is an eight-wire shielded cable. At one end of the cable is a crimped RJ-45 connector to the console port on the router; at the other end of the cable is a DB-9 (female) connector to the serial port on the console terminal.

The following figure illustrates the console cable.

Figure 15 Console cable



Router to LAN Connection

Ethernet interface

The RPU provides two 100BASE-TX FE interfaces. For their attributes, refer to the section “The RPU Module”.

The RPU2 provides three 10/100/1000 Mbps auto-sensing Ethernet interfaces that each accommodate an RJ-45 connector and an SFP module respectively for electrical and optical connections.

The RPU2 provides three 10/100/1000 Mbps Ethernet interfaces, where two are electrical and one provides both fiber-optic and electrical connectors.

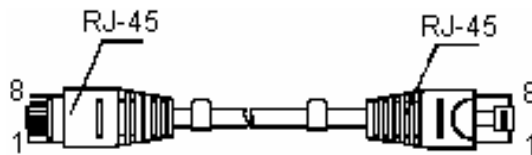
When both electrical and optical connections are available, you can use only one at a time. For the available SFP options and the interface attributes, refer “The RPU2 Module”.

Ethernet cable

1 Electrical Ethernet interface cable

Electrical Ethernet interfaces usually use category 5 twisted-pair cables, as shown in the following figure.

Figure 16 Ethernet cable



Ethernet cables fit into the following two categories:

- Straight-through cable, at both ends of which, the wires are crimped in the RJ-45 connectors in the same sequence. The cable connects different types of devices, such as a terminal device (PC for example) or router to a Hub or LAN switch. The network cables shipped with the router are standard cables.
- Crossover cable, at both ends of which, the wires are crimped in the RJ-45 connectors in different sequences. The cable connects the same type of devices, such as PC to PC or PC to router. You can make crossover cables by yourself as needed.



In preparing network cables, shielded cables are preferred for electromagnetic compatibility sake.

2 Fiber-optic Ethernet interface cable

For the 10/100/1000M Ethernet interfaces on the RPU2, select single mode or multi-mode optical fibers depending on the type of the installed 1000Base-FX SFPs. As the interfaces that these SFP modules provide use LC-type fiber-optic connectors, you must use fibers with LC-type connectors for them. All these SFPs are hot swappable.



SFPs are optional. They are provided only when ordered.

Router to WAN Connection

Many types of WAN interfaces are available with the Router 6000 and the one provided by the main control boards is an AUX interface. The following subsections describe how to connect it. For connecting the WAN interface on a FIC, refer to the relevant contents in the chapter “FICs”.

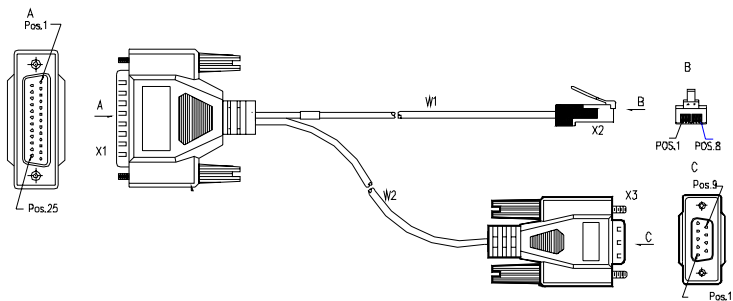
AUX port

AUX is an RS232 asynchronous serial interface, which can back up a WAN interface and provide dial connection. In case of console failure, AUX can function as a console interface. For the AUX interface attributes, refer to the section “The RPU Module” or “The RPU2 Module”.

AUX cable

AUX cable is an eight-wire shielded cable. At one end of the cable is an RJ-45 connector for connecting the console port on the router. At the other end are DB-9 (male) connector and DB-25 (male) connector. You can plug either of them into the serial port on a modem as needed. The following figure illustrates the AUX cable.

Figure 17 AUX cable



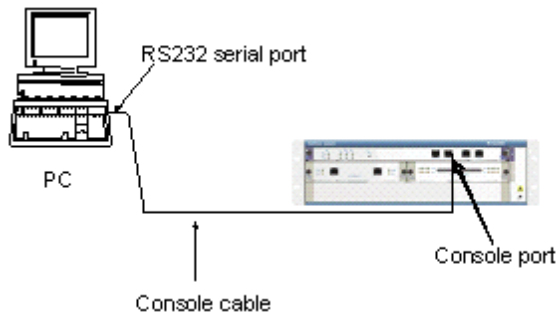
3 Starting and Configuring the Router 6000

Setting up a Configuration Environment

Connecting the router to a console terminal

To set up a local configuration environment, connect the RJ-45 connector of the console cable to the console port on the router, and the DB-9 connector to the serial port on the console terminal, a PC for example, as shown in Figure 18.

Figure 18 Local configuration through the console port



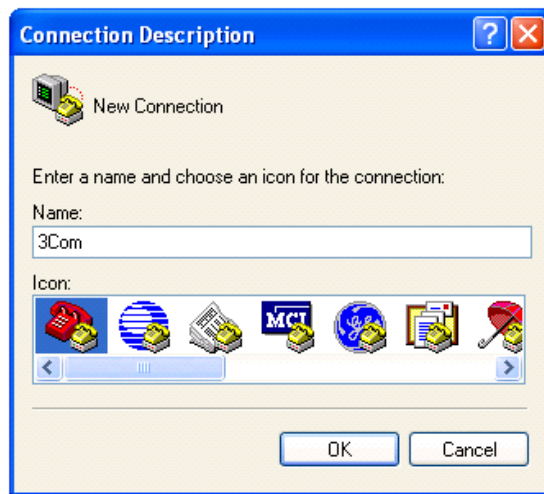
Setting terminal parameters

Follow these steps to set terminal parameters on the console terminal, a PC that is running Windows98 for example:

- 1 Start the PC and select [Start/Programs/Accessories/Communications/HyperTerminal].

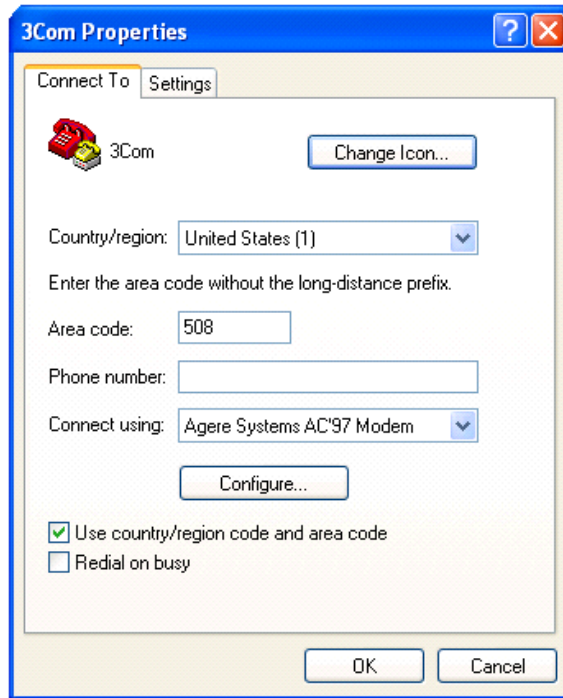
The **HyperTerminal** window displays the **Connection Description** dialog box, as shown in Figure 19.

Figure 19 Set up a new connection



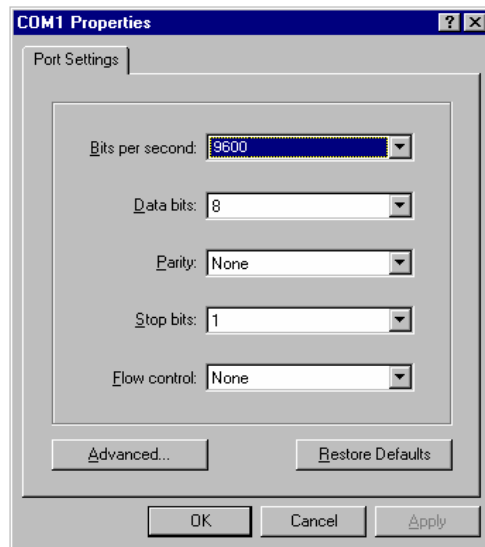
- 2 Enter the name of the new connection in the Name field and click <OK>. The dialog box, as shown in Figure 20, appears.
- 3 Select the serial port to be used from the Connect Using drop-down menu. The serial port must be the same port connected by the console cable.

Figure 20 Set the connection port

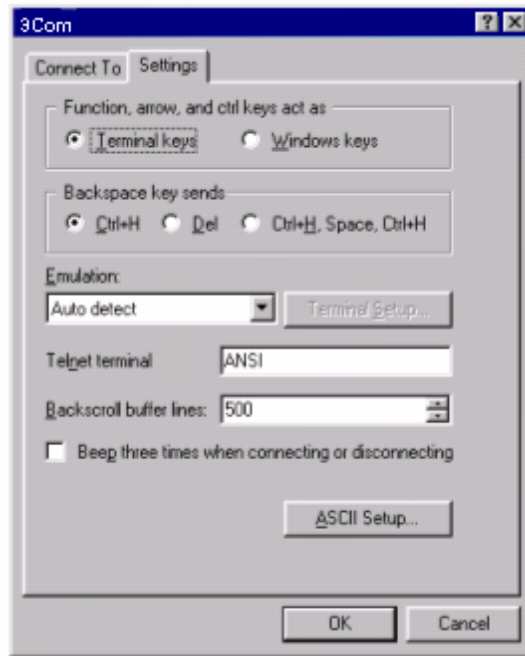


- 4 Click <OK>. The **Port Settings** tab, shown in Figure 21, appears where you can set serial port parameters. Set the following parameters:
- Baud rate = 9600
 - Databit = 8
 - Parity check = none
 - Stopbit = 1
 - Flow control = none

Figure 21 Set communication parameters



- 5 Click <OK>. The **HyperTerminal** dialog box appears.
- 6 Select **Properties**.
- 7 In the **Properties** dialog box, select the **Settings** tab, as shown in Figure 22.
- 8 Select VT100 or Auto detect from the Emulation drop-down menu.
- 9 Click <OK>.

Figure 22 Set the terminal type

Powering on the Router

Checking before power-on

Before powering on the router, check that:

- Both the power cord and the PGND are correctly connected.
- The voltage of the power source complies with the requirement of the router.
- The console cable is correctly connected.
- The PC or the terminal is set up and is running.



WARNING: Before switching on the power, locate the power switch in the equipment room. In case of an accident, you can switch off power quickly.

Powering on the router

Turn on the power switch on the router.

Checking/Operating after power-on

After powering on the router, check that:

- The LEDs on the front panel show that the router is operating normally.

For description on LED behaviors, refer to the section “Generic Modules”.

- The console terminal displays normally.

After you power on the router, you can see the startup banner (refer to the section “Boot Process of the RPU2”). After the boot process or power-on self-test (POST) completes, press <Enter> as prompted and proceed to configure the router when the command line prompt <3Com> appears.

Boot Process of the RPU2

The Boot ROM runs at startup of the router. The terminal displays the following banner:



The banner varies by Boot ROM version.

```
System starts booting ... (1.01)
```

```
*****
*                                     *
*      3Com 6000 Router, 10.05      *
*                                     *
*****
```

```
Copyright© 2003-2004 by 3COM-3COM TECH CO., LTD.
```

```
Compiled at Wed Jul 20 16:35:23 EDT 2005
```

```
Testing memory...OK!
```

```
512M bytes SDRAM Memory
```

```
Hardware Version is 2.0
```

```
CPLD      Version is 1.0
```

```
Press Ctrl-B to enter Boot Menu  0
```

Press <Ctrl+B> to have the system enter Boot Menu. Otherwise, the system starts decompressing the program and displays:

```
System is
self-decompressing.....
OK!
```

```
System is starting...
Starting at 0x10000...
```

```
User interface Con 0 is available.
Press ENTER to get started.
```

Press <Enter>. The console screen displays:

```
<3Com>
```

The prompt indicates that the router has entered user view and is ready for configuration.



- *Immediately after “3Com 6000 Router, 10.05” appears, “System starts booting ... (1.01)” disappears. (10.05 is the version of the Boot ROM.)*
- *To have the system enter Boot Menu, press <Ctrl+B> within three seconds after “Press Ctrl-B to enter Boot Menu...” appears; otherwise, the system starts decompressing the program. To enter Boot Menu after that, you must reboot the router.*
- *If the bootstrap discovers that the version of the Boot ROM in the Comware 3.11 is inconsistent with the one in use, it automatically upgrades the Boot ROM program and displays:*

```
The current starting file is main application file—flash:/b14d008!
```

```
Upgrade Bootrom.....!
```

```
Download completed.
```

```
Please wait,it needs a long time#####
```

```
Writing into Boot ROM Succeeds.
```

```
System will reboot...
```

Upon completion of the upgrade the router reboots with the running Boot ROM upgraded.

Router Configuration Basics

The following are the general procedures for configuring the router:

- 1 Before working on the router, fully comprehend network requirements, such as networking purpose, position of the router on the network, subnetting, type of the WAN and transmission medium, security policy and reliability.
- 2 Based on the requirements, draw a clear and complete networking diagram.
- 3 Configure the WAN interface on the router.
 - First, configure the physical operating parameters (such as synchronous/asynchronous serial interface, baud rate and synchronization clock) of the interface according to the transmission medium of the WAN. For the dial-up interface, you also need to configure DCC parameters.
 - Then, configure the link layer protocol and the related operating parameters according to the type of the WAN.
- 4 Assign an IP address or IPX network number to each interface on the router according to subnetting.
- 5 Configure routing. When enabling a dynamic routing protocol, you also need to configure the related operating parameters.
- 6 Configure the security settings as needed.
- 7 Configure the reliability settings as needed.

For more information on the protocols and functions provided by the router, refer to *V2.41 Configuration Guide*.

Command Line Interface**Characteristics of the command line interface**

The command line interface (CLI) available with the 3Com Router 6000 provides commands for configuring and managing the router. It supports:

- Configuring the router locally through the console port.
- Telnetting to the router to configure it locally or remotely; telnetting from the router to other routers to manage them.
- Getting online help whenever you want by entering a question mark (?).

- Testing reachability of networks quickly with tools, such as **tracert** and **ping**.
- Rich debugging information for network diagnosis.
- The command line interpreter that supports fuzzy keyword search. When inputting a command, you only need to enter its conflict-free portion, for example, **dis** for the **display** command.

Command line interface

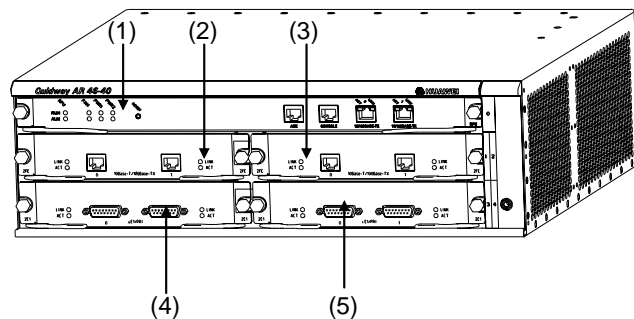
The CLI of the 3Com Router 6000 provides rich configuration commands. They are divided in system view into multiple groups, each associated to a view (refer to *V2.41 Configuration Guide*). You can switch between different views through commands. Normally, you can only execute the commands appropriate to the view that you access. However, you can execute in any view some commands in common use, such as **ping**, **display current-configuration**, and **interface**.

Arranging Slots and Numbering Interfaces

The Router 6000 provides many types of interfaces, such as console, AUX, Ethernet, serial (synchronous/asynchronous), and asynchronous port. The following describes how these interfaces are numbered.

1 Slot arrangement

Figure 23 Slot arrangement on the 3Com Router 6040



1) Slot 0

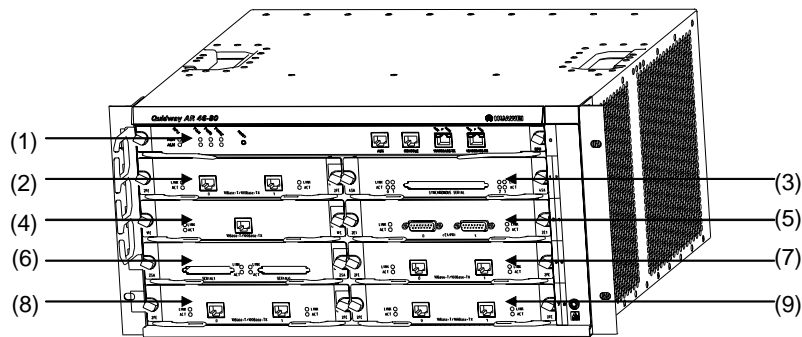
2) Slot 1

3) Slot 2

4) Slot 3

5) Slot 4

Figure 24 Slot arrangement on the 3Com Router 6080



- | | | |
|-----------|-----------|-----------|
| 1) Slot 0 | 2) Slot 1 | 3) Slot 2 |
| 4) Slot 3 | 5) Slot 4 | 6) Slot 5 |
| 7) Slot 6 | 8) Slot 7 | 9) Slot 8 |

2 Interface numbering

The following are interface numbering rules with the Router 6000:

- The interfaces are represented by *interface-type X/Y/Z*, where *interface-type* can be serial, asynchronous, ethernet or ATM, and so on; *X* specifies the slot number; *Y* specifies the daughter card number (it is 0 when no daughter card is installed); and *Z* specifies the interface sequence number.
- As shown in the above figures, different interfaces on an interface module share the same slot number *X*.
- For every interface, *Y* starts from 0 and *Z* indicates the interface sequence on the interface module, from left to right.

4 Troubleshooting

Troubleshooting of the Power System

Symptom: The RUN LED on the PSU is OFF or blinking.

Solution: Check that:

- The power switch on the router is turned on.
- The switch of the power source is turned on.
- The power cord is correctly connected.
- The power source meets the requirement of the router. If the PSU is DC-input, check the AC/DC OK LED: solid ON means the input voltage is normal (85 to 264 V), off means the input voltage is abnormal.

Troubleshooting the Configuration System

If the router passes POST after powered up, the console screen displays the startup banner; if faults occur to the configuration system, the console screen displays nothing or only illegible characters.

Symptom 1: After the router is powered on, the console screen displays nothing.

Solution: Check that:

- The power system is normal.
- The console cable is correctly connected.

Check the console cable and the terminal (HyperTerminal for example) settings.

Symptom 2: After the router is powered on, the console screen displays illegible characters.

Solution: Verify that the terminal settings are as follows:

Baud: 9600

Data bits: 8

Stop bit: 1

Parity: None

Flow control: None

Terminal emulation: VT100

Reconfigure the parameters if their values are different.

Troubleshooting Application Image Upgrade

Symptom 1: Start the router and upgrade Comware 3.11 software using TFTP. The console screen displays:

```

Download Program To Flash Through Net Port
boot device           : ErrDev
unit number           : 0
processor number       : 0
file name              : Router6000.bin
inet on ethernet (e)  : 1.1.1.1
host inet (h)          : 1.1.1.2
user (u)               : user
ftp password (pw)      : password
flags (f)              : 0x80
  
```

```

Loading... Loading Failed
  
```

Solution: Fault occurs due to selection of the incorrect boot device ErrDev.

Change ErrDev to wancom, the application upgrade device of the Router 6000.

Symptom 2: Start the router and upgrade the application image using TFTP. The console screen displays:

```

Download Program To Flash Through Net Port
boot device           : wancom
unit number           : 0
processor number       : 0
file name              : Router6000.bin
inet on ethernet (e)  : 1.1.1.1
host inet (h)          : 1.1.1.2
user (u)               : user
ftp password (pw)      : password
flags (f)              : 0x80
  
```

```

Attached TCP/IP interface to wancom0.
  
```

```
Subnet Mask: 0xffffffffc0
Attaching network interface lo0... done.

Loading... Error code 2: Access violation
tftpGet: Error occurred while transferring the file.
A bad file or twisted pair doesn't link correctly!Loading
Failed
```

Solution: Fault occurs because the source file does not exist or the network cable is not connected. Ensure that the source file is in the TFTP root directory and the cable is connected securely.

Symptom 3: Start the router and upgrade Comware 3.11 software using TFTP. The console screen displays:

```
DownLoad Program To Flash Through Net Port
boot device          : wancom
unit number          : 0
processor number      : 0
file name             : Router6000.bin
inet on ethernet (e) : 1.1.1.1
host inet (h)         : 1.1.1.3
user (u)              : user
ftp password (pw)     : password
flags (f)             : 0x80

Attached TCP/IP interface to wancom0.
Attaching network interface lo0... done.

Loading... tftpGet: Error occurred while transferring the
file.
A bad file or twisted pair doesn't link correctly!Loading
Failed
```

Solution: Fault occurs because the IP address of the PC is incorrect.

- Correctly assign an IP address to the PC.

Symptom 4: Start the router and upgrade Comware 3.11 software using TFTP. The console screen displays:

```
DownLoad Program To Flash Through Net Port
boot device          : wancom
unit number          : 0
processor number      : 0
file name             : Router6000.bin
inet on ethernet (e) : 1.1.1.1
```

```
host inet (h)      : 1.1.1.2
user (u)           : user
ftp password (pw)  : password
flags (f)          : 0x80
```

```
Loading... Done
1000 Bytes Downloaded.Crc Error!
```

Solution: Fault occurs because an incorrect application image file is downloaded.

- Download the correct application image file.



The bar code labels on the chassis and the FICs contain information about production and servicing. Before you ask your agent for servicing, provide its bar code

5 Router Software Maintenance

This chapter describes how to maintain the software on the Router 6000. The router manages three types of files:

- Boot ROM image file
- Application image file
- Configuration file

Software maintenance mainly involves these three types of files. This chapter discusses only the software maintenance functions listed in Boot Menu, for example upgrading the Boot ROM and application. For information on other functions, refer to the Configuration Guide.



CAUTION: Upgrade software only when necessary and under the guidance of technical staff.

Maintaining RPU or RPU2 Software

Boot Menu Start the router; when the message “Press Ctrl-B to enter Boot Menu” appears, press <Ctrl+B>. The console screen displays:

Please input bootrom password:

Enter the correct password (void by default) to have the system display the Boot Menu:

Boot Menu:

- 1: Download application program with XMODEM
- 2: Download application program with NET
- 3: Download application program with NET to CF card
- 4: Set application file type
- 5: Display applications in Flash
- 6: Clear application configuration
- 7: Reset console authentication

```

8: Start up and ignore configuration
9: Boot Rom Operation Menu
a: Do not check the version of the software
b: Start application program from Flash
c: Start application program from Compact Flash
d: Exit and reboot
Enter your choice(1-d):

```



- *This section describes Boot ROM maintenance using V10.05 as an example.*
- *“The entire Boot ROM image file” in the manual includes two segments: extended and basic. You can separately upgrade and back up the extended segment.*

Boot Menu options are described in the following steps:

- 1 Refer to the section “Upgrading Software Using Xmodem” to download an application image using Xmodem (Boot Menu option 1).
- 2 Refer to the section “Upgrading the Application Image Using TFTP” to download an application image using Ethernet (Boot Menu option 2).

If you select this option, the following Net Port Download Menu appears:

```

Net Port Download Menu:
1: Change Net Parameter
2: Download From Net to Flash
3: Download From Net to Ram
4: Exit to Main Menu
Enter your choice(1-4):1

```

- 3 Refer to the section “Upgrading the Application Image Using TFTP” to download an application image from the network to the CF card (Boot Menu option 3).

If you select this option, the following Net Port Download Menu appears:

```

Net Port Download Menu:
1: Change Net Parameter
2: Download From Net to CF
3: Download From Net to Ram
4: Exit to Main Menu
Enter your choice(1-4):

```

- 4 Set the type of the application image file to change the boot file selection order or type of a boot file.

The dual image function is available with the router. By default, the system defines and attempts to boot in order with three boot files: main,

backup, and secure. If it fails to boot with the secure boot file, it prompts the boot failure.

For example, select Boot Menu option 4. The console screen displays a menu similar to the following:

```

M=MAIN      B=BACKUP      S=SECURE
NO.   Name                               Size      Type      Time
1     main.bin                      5988025    M
Oct/10/2002 10:10:10
2     backup.bin                    5985198    B
Oct/10/2002 10:10:10
3     a.bin                          987491     N/A
Oct/10/2002 10:10:10
4     secure.bin                    5988022    S
Oct/10/2002 10:10:10
5     Exit to main menu

```

```
Enter your choice(1-5): 3
```

Select option 3. The system displays the following menu, where you can change the file type of a.bin.

```

Set this file as:
1.   Main
2.   Backup
3.   Exit
Enter your choice(1-3): 1

```

Select option 1 to specify the a.bin file as the main boot file. After the modification takes effect, the file type of the original main file named main.bin changes to N/A. The a.bin file is now the first boot file.

5 Display applications in Flash memory.

Select Boot Menu option 5. The console screen displays:

```

M=MAIN      B=BACKUP      S=SECURE
NO.   Name                               Size      Type      Time
1     main.bin                      5988025    N/A
Oct/10/2002 10:10:10
2     backup.bin                    5985198    B
Oct/10/2002 10:10:10
3     a.bin                          5987491    M
Oct/10/2002 10:10:10
4     s_system.bin                  5988022    S
Oct/10/2002 10:10:10
5     Exit to main menu

```

You can see that the type of a.bin is now M.

Press <Enter> to return to Boot Menu.

6 Clear the application configuration file.

Select Boot Menu option 5. The screen displays:

```
Clear configuration, are you sure?[Y/N]
```

Press <Y> to clear the configuration file saved last time. It cannot survive a reboot.

Press <N> to reject the clear operation.

7 Reset console authentication.

This option allows you to log in from the console port without authentication.

Select Boot Menu option 7. Exit and then restart the router. The screen displays "Login authentication ignored", allowing you to log in from the console port without authentication.

Note that this is a one-time operation. It takes effect only at the first reboot after resetting console authentication is selected. At the next reboot, console authentication is required.

8 Start up and ignore configuration.

Select Boot Menu option 8. The system sets an Ignore flag to Flash memory and displays:

```
Flag set successfully.
```

Thus, empty configuration applies at reboot. The system removes the Ignore flag after its boot is completed.

In case you forget the password, you may select this option to have the router boot with the configuration file ignored. After accessing the system, you may change or delete the password. Note that if not saved, the modified configuration cannot survive a reboot. To have the router reboot with the new configuration, you must perform the save operation after completing the configuration.

9 Boot ROM Operation Menu

Select Boot Menu option 9 to enter Boot ROM Download Menu as follows for upgrade, backup, or recovery:

```
Boot ROM Download Menu:
```

- 1: Download Boot ROM with XModem
- 2: Download Extended Segment of Boot ROM with XModem
- 3: Restore Extended Segment of Boot ROM from FLASH
- 4: Backup Extended Segment of Boot ROM to FLASH

```
5: Exit to Main Menu
Enter your choice(1-5):
```

10 Ignore software check (Boot Menu option a).

When upgrading software, make sure that you are using the correct software version. If the upgrade still fails and the system displays “invalid version” in this case, you can use this option. It allows the system to upgrade software without checking the version of extended Boot ROM image segment, Boot ROM image, and application image for backward compatibility. This is a one-time operation, however; the router checks version again at reboot.

11 Boot from Flash (Boot Menu option b).

12 Boot from the CF card (Boot Menu option c).

13 Exit and reboot (Boot Menu option d).

Upgrading Software Using Xmodem

You can use the console port to upgrade software using Xmodem without the need of setting up a configuration environment.

Upgrading the application image

- 1 From the Boot Menu (refer to the section “Boot Menu”) and enter option 1 to download an application image using Xmodem. The router supports the following downloading speeds:

```
Please choose your download speed:
1: 9600 bps
2: 19200 bps
3: 38400 bps
4: 57600 bps
5: 115200 bps
6: Exit to Main Menu
Enter your choice(1-6):
```

- 2 Select an option. For example, if option 5 for 115200 bps is selected, the following message appears:

```
Download speed is 115200 bps. Change the terminal's speed
to 115200 bps, and select XModem protocol. Press ENTER key
when ready.
```

- 3 Change the terminal baud rate (see Figure 21) to the same baud rate for software download (115200 bps in this example). After that, select [Dial-in/Disconnect] to disconnect the terminal, and [Dial-in/Dialing] to reconnect it. Then, press <Enter> to start downloading. The system displays:

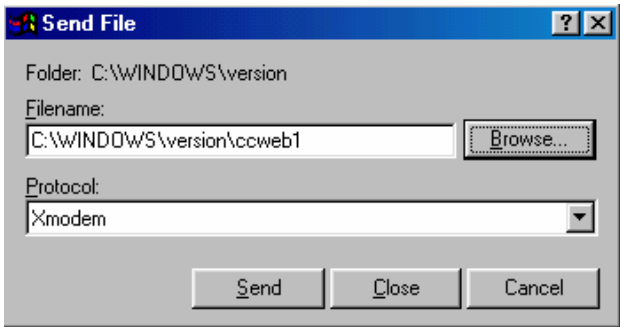
```
Please Select Program File
Downloading ... CCCCC
```



The new baud rate takes effect only after you reconnect the terminal emulation program.

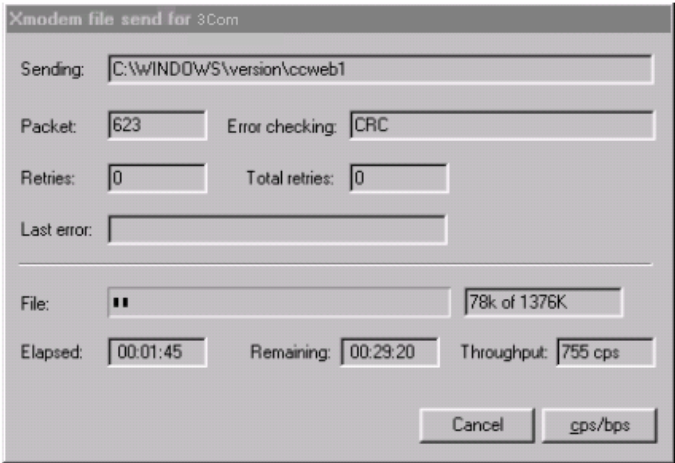
- 4 Select [Transfer/Send File] in the terminal window. The following dialog box pops up:

Figure 25 Set Send File parameters



- 5 Click <Browse>. Select the file to be downloaded and set protocol to Xmodem. Click <Send>. The following interface pops up:

Figure 26 Load the file using Xmodem



- 6 After completing download, the system begins writing data to Flash memory, and then displays the following information on the screen:

```
Download completed.
```

Then, the system asks you to select a file type:

```
please select file to be saved as
1. main application file
2. backup application file
3. secure application file
4. cancel downloading
Enter your choice(1-4):
```

After you select an option, the system begins writing the file to Flash memory.

```
Writing to flash memory...
Please waiting,it need a long time (about 5 min).
Write Flash Success.
Please return to 9600 bps. Press ENTER key to reboot the
system.
```

Change the baud rate of the console terminal to 9600 bps, disconnect and redial. Then you can see the system boot banner.

Upgrading the entire Boot ROM program

- 1 Enter Boot Menu (see the section “Boot Menu”) and select option **8** to enter Boot ROM Download Menu as follows:

```
Boot ROM Download Menu:
1: Download Boot ROM with XModem
2: Download Extended Segment of Boot ROM with XModem
3: Restore Extended Segment of Boot ROM from FLASH
4: Backup Extended Segment of Boot ROM to FLASH
5: Exit to Main Menu
Enter your choice(1-5):
```

- 2 Select option **1** in the menu to download the entire Boot ROM image using Xmodem. multiple speed options are available. The subsequent steps are the same as those described in the section for upgrading the application image.



CAUTION: You are recommended to upgrade the entire Boot ROM program unless necessary and with the guide of technical staff, because no means are available for on-field restore in case of an update failure.

Upgrading the extended segment of the Boot ROM image

- 1 Enter Boot Menu (refer to the section “Boot Menu”) and select option **8** to enter Boot ROM Download Menu.
- 2 Select option **2** in the menu to upgrade the extended segment of the Boot ROM image using Xmodem. Multiple speed options are available. The subsequent steps are the same as those described in the section for upgrading the application image.



CAUTION: *This upgrade approach upgrades only a portion of the Boot ROM image, so you can make a second attempt once errors occur.*



Upon completion of application image upgrade, the router reboots and checks Boot ROM version for consistency before starting the Comware 3.11 software. If the version of the current extended Boot ROM image segment is not the same as that of the extended segment to be started, the system automatically updates the Boot ROM image, and displays “Upgrade Bootrom.....! Download completed.Please wait, it needs a long time##### Writing into Boot ROM Succeeds.” Then, the system continues its boot process.

Backing Up/Restoring the Extended Segment of the Boot ROM Image

Backing up the extended segment of the Boot ROM image to the Flash

Follow these steps to back up the extended segment of the Boot ROM image:

- 1 Enter Boot Menu (refer to the section “Boot Menu”) and select option **8** to enter Boot ROM Download Menu.
- 2 Select option **4** in the menu to copy the current extended segment to Flash memory.

Backup Extended Segment, are you sure?[Y/N]

Enter <Y>. The system displays:

Writing to FLASH.Please wait...####

Backing up Boot ROM program to FLASH succeeded!

- 3 When Boot ROM Download Menu appears again, select option **5** to exit and reboot the router.

Restoring the extended segment of the Boot ROM image from Flash

In case of extended Boot ROM segment errors or an inadvertent upgrade operation, take these steps to restore the extended segment of the Boot ROM image from Flash memory to the Boot ROM:

- 1 Enter Boot Menu (refer to the section “Boot Menu”), and select option **8** to enter Boot ROM Download Menu.
- 2 Select option **3** in Boot ROM Download Menu to restore the extended segment from Flash memory.

```
Restore Extended Segment, are you sure?[Y/N]
```

Enter <Y>. The system displays:

```
Writing to Boot ROM.Please wait...#####
Restoring Boot ROM program succeeded!
```

- 3 When Boot ROM Download Menu appears again, select option **5** to exit and reboot the router.

Upgrading the Application Image Using TFTP

Upgrading the application image with NET is to download using an Ethernet interface. In this approach, the router is TFTP Client and needs connecting to TFTP Server using a fixed Ethernet interface. The following describes how to upgrade the application image in this approach:

- 1 Start TFTP Server on the PC connected to the Ethernet interface on the router and set the path for getting the source file.



CAUTION: No TFTP Server is available with the Router 6000. You must make sure that they are available yourself.

- 2 In Boot Menu select option **3** to enter Net Port Download Menu as follows:

```
Net Port Download Menu:
1: Change Net Parameter
2: Download From Net to Flash
3: Download From Net to SDRAM and Run??
4: Exit to Main Menu
Enter your choice(1-4):1
```

- 3 Select option **1** in Net Port Download Menu for example to change the download parameters as follows:

```
Change Download parameter
Download device           :eth0
```

```
Download file(Max 60 char) :vrp.bin
IP address of eth0          :1.1.1.11
Subnet mask for eth0        :255.0.0.0
IP address of the server    :1.1.1.10
IP address of the gateway   :

Saving the net configuration, are you sure?[Y/N]
```

Table 8 Description on the download parameters

Parameter	Description
Download device	The Ethernet port for downloading, which must be eth0.
Download file (Max 60 char)	Name of the Comware 3.11 file to be downloaded.
IP address of eth0	IP address of interface eth0.
Subnet mask for eth0	Subnet mask of interface eth0.
IP address of the server	IP address of the server where Comware 3.11 is retained.
IP address of the gateway	You must configure it if the server and the router are not located on the same segment.

Press <Y> to save the configuration.

- 4** When Net Port Download Menu appears, select option **2** to download and write the application image to Flash memory. The system displays:

```
Starting the TFTP
download.....
TFTP download completed.
File length = [07600856]

Writing program code to FLASH...
Please wait, it may take a long time.....
Writing into Flash Successfully!
```

Now, the system returns to Net Port Download Menu.

If you select option **3** in the menu to directly download the program to the SDRAM and run it there, the downloaded application image cannot survive a reboot because the file is not written to Flash memory.



Upon completion of application image upgrade, the router reboots and checks Boot ROM version for consistency before starting the Comware 3.11 software. If the version of the current extended Boot ROM image

segment is not the same as that of the extended segment to be started, the system automatically updates the Boot ROM image, and displays "Upgrade Bootrom.....! Download completed. Please wait, it needs a long time##### Writing into Boot ROM Succeeds." Then, the system continues its boot process.

**Dealing with a
Router Password
Loss**

Contact our technical staff in the event of Boot ROM password or user password loss. They can help you to set a new password.

A

OBTAINING SUPPORT FOR YOUR 3COM PRODUCTS

3Com offers product registration, case management, and repair services through eSupport.3com.com. You must have a user name and password to access these services, which are described in this appendix.

Register Your Product to Gain Service Benefits

To take advantage of warranty and other service benefits, you must first register your product at:

<http://eSupport.3com.com/>

3Com eSupport services are based on accounts that are created or that you are authorized to access.

Solve Problems Online

3Com offers the following support tool:

- **3Com Knowledgebase** — Helps you to troubleshoot 3Com products. This query-based interactive tool is located at:

<http://knowledgebase.3com.com>

It contains thousands of technical solutions written by 3Com support engineers.

Purchase Extended Warranty and Professional Services

To enhance response times or extend your warranty benefits, you can purchase value-added services such as 24x7 telephone technical support, software upgrades, onsite assistance, or advanced hardware replacement.

Experienced engineers are available to manage your installation with minimal disruption to your network. Expert assessment and implementation services are offered to fill resource gaps and ensure the success of your networking projects. For more information on 3Com Extended Warranty and Professional Services, see:

<http://www.3com.com/>

Contact your authorized 3Com reseller or 3Com for additional product and support information. See the table of access numbers later in this appendix.

Access Software Downloads

You are entitled to *bug fix / maintenance releases* for the version of software that you initially purchased with your 3Com product. To obtain access to this software, you need to register your product and then use the Serial Number as your login. Restricted Software is available at:

<http://eSupport.3com.com/>

To obtain software releases that *follow* the software version that you originally purchased, 3Com recommends that you buy an Express or Guardian contract, a Software Upgrades contract, or an equivalent support contract from 3Com or your reseller. Support contracts that include software upgrades cover feature enhancements, incremental functionality, and bug fixes, but they do not include software that is released by 3Com as a separately ordered product. Separately orderable software releases and licenses are listed in the 3Com Price List and are available for purchase from your 3Com reseller.

Contact Us

3Com offers telephone, internet, and e-mail access to technical support and repair services. To access these services for your region, use the appropriate telephone number, URL, or e-mail address from the table in the next section.

Telephone Technical Support and Repair

To obtain telephone support as part of your warranty and other service benefits, you must first register your product at:

<http://eSupport.3com.com/>

When you contact 3Com for assistance, please have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision level
- Diagnostic error messages
- Details about recent configuration changes, if applicable

To send a product directly to 3Com for repair, you must first obtain a return materials authorization number (RMA). Products sent to 3Com without authorization numbers clearly marked on the outside of the package will be returned to the sender unopened, at the sender's expense. If your product is registered and under warranty, you can obtain an RMA number online at <http://eSupport.3com.com/>. First-time users must apply for a user name and password.

Telephone numbers are correct at the time of publication. Find a current directory of 3Com resources by region at:

<http://csoweb4.3com.com/contactus/>

Country	Telephone Number	Country	Telephone Number
Asia, Pacific Rim — Telephone Technical Support and Repair			
Australia	1800 075 316	Philippines	1800 144 10220 or 029003078
Hong Kong	2907 0456	PR of China	800 810 0504
India	000 800 440 1193	Singapore	800 616 1463
Indonesia	001 803 852 9825	South. Korea	080 698 0880
Japan	03 3507 5984	Taiwan	00801 444 318
Malaysia	1800 812 612	Thailand	001 800 441 2152
New Zealand	0800 450 454		
Pakistan Call the U.S. direct by dialing 00 800 01001, then dialing 800 763 6780			
Sri Lanka Call the U.S. direct by dialing 02 430 430, then dialing 800 763 6780			
Vietnam Call the U.S. direct by dialing 1 201 0288, then dialing 800 763 6780			
You can also obtain non-urgent support in this region at this email address apr_technical_support@3com.com			
Or request a return material authorization number (RMA) by FAX using this number: +61 2 9937 5048, or send an email at this email address: ap_rma_request@3com.com			

Europe, Middle East, and Africa — Telephone Technical Support and Repair

From anywhere in these regions not listed below, call: +44 1442 435529

From the following countries, call the appropriate number:

Austria	0800 297 468	Luxembourg	800 23625
Belgium	0800 71429	Netherlands	0800 0227788
Denmark	800 17309	Norway	800 11376
Finland	0800 113153	Poland	00800 4411 357
France	0800 917959	Portugal	800 831416
Germany	0800 182 1502	South Africa	0800 995 014
Hungary	06800 12813	Spain	900 938 919
Ireland	1 800 553 117	Sweden	020 795 482
Israel	180 945 3794	Switzerland	0800 553 072
Italy	800 879489	U.K.	0800 096 3266

You can also obtain support in this region using this URL: <http://emea.3com.com/support/email.html>

You can also obtain non-urgent support in this region at these email addresses:

Technical support and general requests: customer_support@3com.com

Return material authorization: warranty_repair@3com.com

Contract requests: emea_contract@3com.com

Country	Telephone Number	Country	Telephone Number
Latin America — Telephone Technical Support and Repair			
Antigua	1 800 988 2112	Guatemala	AT&T +800 998 2112
Argentina	0 810 444 3COM	Haiti	57 1 657 0888
Aruba	1 800 998 2112	Honduras	AT&T +800 998 2112
Bahamas	1 800 998 2112	Jamaica	1 800 998 2112
Barbados	1 800 998 2112	Martinique	571 657 0888
Belize	52 5 201 0010	Mexico	01 800 849CARE
Bermuda	1 800 998 2112	Nicaragua	AT&T +800 998 2112
Bonaire	1 800 998 2112	Panama	AT&T +800 998 2112
Brazil	0800 13 3COM	Paraguay	54 11 4894 1888
Cayman	1 800 998 2112	Peru	AT&T +800 998 2112
Chile	AT&T +800 998 2112	Puerto Rico	1 800 998 2112
Colombia	AT&T +800 998 2112	Salvador	AT&T +800 998 2112
Costa Rica	AT&T +800 998 2112	Trinidad and Tobago	1 800 998 2112
Curacao	1 800 998 2112	Uruguay	AT&T +800 998 2112
Ecuador	AT&T +800 998 2112	Venezuela	AT&T +800 998 2112
Dominican Republic	AT&T +800 998 2112	Virgin Islands	57 1 657 0888

You can also obtain support in this region in the following ways:

- Spanish speakers, enter the URL: <http://lat.3com.com/lat/support/form.html>
- Portuguese speakers, enter the URL: <http://lat.3com.com/br/support/form.html>
- English speakers in Latin America, send e-mail to: lat_support_anc@3com.com

US and Canada — Telephone Technical Support and Repair

All locations:	Network Jacks; Wired or Wireless Network Interface Cards:	1 800 876 3266
	All other 3Com products:	1 800 876 3266
